BOOK OF ABSTRACTS

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(22nd SPPS Meeting)

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Institute for Biological Research "Siniša Stanković", University of Belgrade

Faculty of Biology, University of Belgrade

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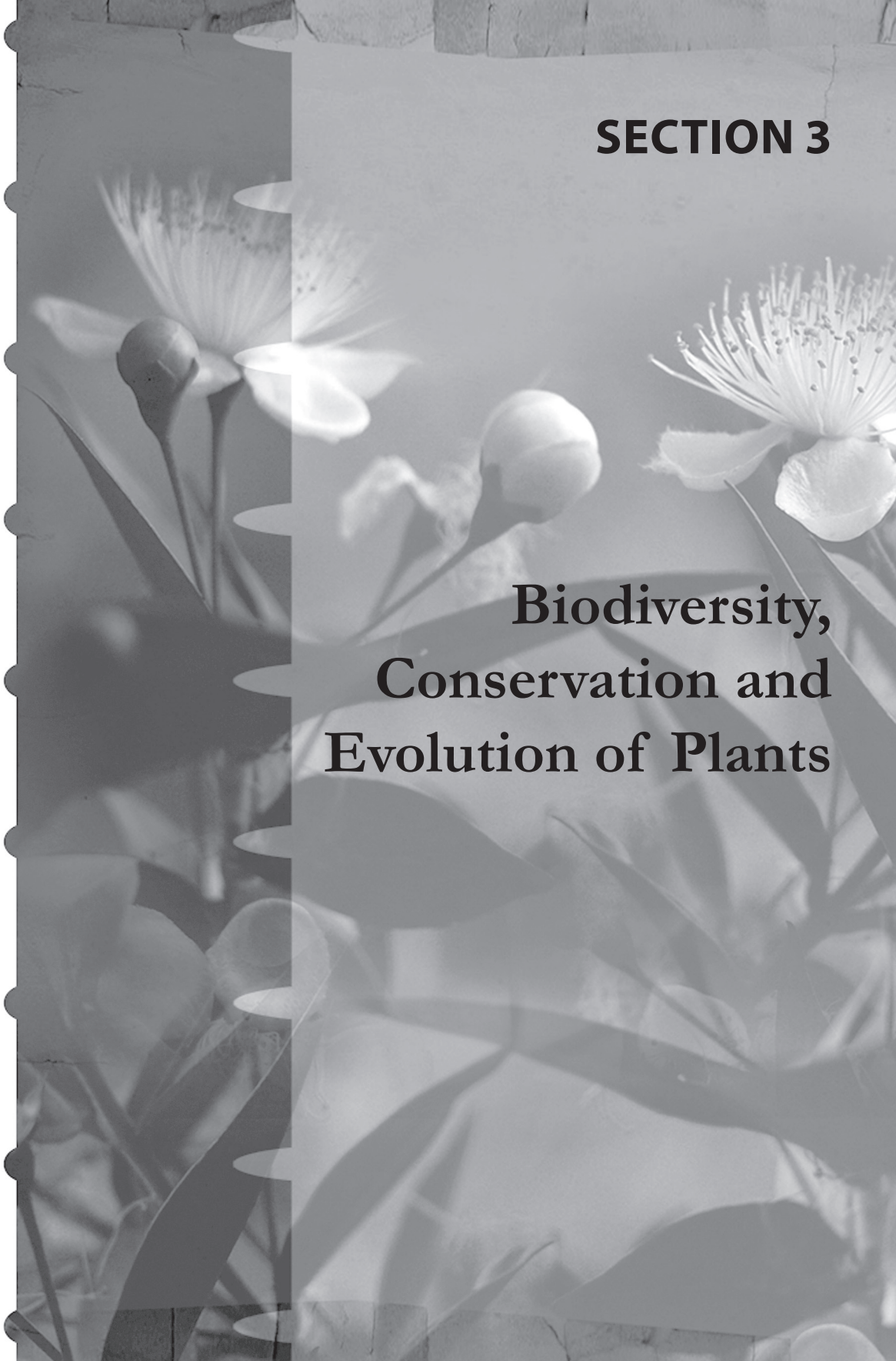

SECTION 3

Biodiversity, Conservation and Evolution of Plants

Metal content in aerial parts of the species *Teucrium montanum* L. sampled from habitats with serpentine and calcareous substrate

PP3-13

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The purpose of this comparative analysis is determination of the total quantity of metals (Mg, Ca, K, Ni, Fe, Mn, Zn, Cu, Cr and Pb) in soil samples and aboveground plant parts of plant *Teucrium montanum* L. (*Lamiaceae*) sampled from 23 different localities on serpentine and calcareous habitats on the territory of Serbia. Metal contents were determined by means of Inductively Coupled Plasma – Optical Emission Spectrometry (ICP-OES). The preparation of the samples was done by wet digestion. The obtained results showed that the quantities of certain metals (Mg, Fe, Ni and Mn) in the soil from the serpentine habitats were greater in comparison with other metals (Ca, Zn and K) that were more frequently found in the soil from the calcareous habitats. The results demonstrated that the analysed plant samples from the serpentine habitats contained higher quantity of Fe, Ni and Cr as opposed to the plant samples from the calcareous habitats that contained greater quantity of Ca and Zn. The results of the conducted research showed that the examined plant species accumulates analysed metals in different quantities, which mostly depends on the type of substrate from which the species is sampled.

Keywords: metal content, *Teucrium montanum*, calcareous substrate, serpentine substrate

This investigation was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (Grant No. III41010).

Flavonoid and carotenoid content in floral organs of *Iris pumila*

PP3-14

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Flavonoids and carotenoids are plant pigments that play a variety of functional roles in higher plants. Beside their impacts on flower color, they are involved in plant growth, development and protection against a wide range of environmental stressors. They act either as light attenuators and free radical scavengers (e.g. anthocyanins) or participate in non-photochemical quenching (carotenoids). To quantify the accumulation of flavonoids and carotenoids in different floral organs, fifty *Iris pumila* genotypes grown in a common-garden and belonging to different color classes (yellow, blue, violet, dark blue and dark violet) were assessed. One flower per each genotype was harvested and analyzed spectrophotometrically for the content of three flavonoids (anthocyanins, flavones, flavonols) and total carotenoids in different floral organs: falls, standards, stamens and style arms. While the quantity of flavonoids was found to be floral organ- and color morph-specific, the amount of carotenoids varied only among individual floral organs. The variation pattern of the analyzed compounds displayed identical trend - the lowest amounts were recorded in the sta-

men and style arm, and the highest in the standard and fall. The content of carotenoids appeared to be the highest in floral organs of the yellow color morphs, whereas in the blue, violet, dark blue and dark violet flower phenotypes its abundance was a half of that recorded for the yellow one. Conversely, the anthocyanin content was rather high in the floral organs of dark violet and dark blue color morphs, but extremely low in those of the yellow one. Our results clearly suggest that a greater accumulation of both plant pigments in sterile rather than in fertile flower organs could be causally related to their specific function in the process of sexual reproduction, where the former serve to attract plant pollinators, while the latter promote an efficient pollen deposition.

Keywords: anthocyanins, carotenoids, *Iris pumila*

This work was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia, Grant No. 173007.

Characterization of storage seed reserves of *Chenopodium quinoa* using Raman spectroscopy

PP3-15

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Quinoa (*Chenopodium quinoa* Willd.) is a crop whose seeds are storage of proteins, mineral nutrients, lipids and carbohydrate reserves, which are localized in cotyledons and perisperm. The aim of this study was to localize carbohydrates and proteins in quinoa seed and find differences in chemical composition between two genotypes (Puno and Titicaca) using Raman spectroscopy and chemometric tools (PCA). The experiment was carried out during the 2016 growing season in rainfed conditions in the north of Serbia (area of Subotica). The experiment was set up in a split-split plot system, with four replications on the soil type chernozem. Raman spectroscopy analysis was performed using a XploRA Raman spectrometer at 785 nm on longitudinal quinoa seed sections. Raman spectra were recorded in two seed regions: cotyledon and perisperm. Spectra were recorded in the range from 200 to 1750 cm^{-1}. Analysis of the scores of the principal components revealed a division into two different groups, classified according to genotype differentiation observed in both seed compartments (cotyledons and perisperm). The analysis of the loading pointed out the region of the spectrum that contributes to genotype separation, e.g. the band at 472 cm^{-1} regarding the glucosidic ring vibration and is probably related to the amylopectin content in perisperm region. According to the loading plot corresponding to cotyledons part, the highest loadings were observed in spectral range from 1100 to 1650 cm^{-1}, including the most important bands originating from Amide I, II and probably protein with globoid crystals of phytin, which were responsible for genotype separation.

Keywords: quinoa, Raman spectroscopy, starch, Amide I and II, phytin.

This study was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (Grant No. TR 31005).

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